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02/10/2015



## New inverter designed for pumps, fans and compressors resets performance benchmarks

**Mitsubishi Electric has developed a new generation of drive technology for its latest pump and fan inverter, the FR-F800, which offers previously unattainable performance in terms of energy saving, optimised speed control, simple start-up, connectivity and the versatility of its features.**

The F800 is designed to be used predominantly with pumps and fans but is equally suitable for compressors and HVAC applications. It features many innovative functions that ensure accurate control, while also achieving energy efficiency figures of 98%.

There are initially six units in the series, three covering the 200V-240V range from 0.75kW-110kW and three more in the 380V-500V range from 0.75kW-630kW.

At the heart of the all new FR-F800 is a bespoke PID controller and on-board PLC which provides the drive with true stand-alone capabilities. For instance, it can control fans, pumps and

compressors directly rather than requiring an additional controller. Other PID functions include: a pump-stir function, upper and lower limit pre-warnings, pipe burst detection and dry run protection, water hammer prevention and automatic tuning.

To enhance its capabilities, the F800 is fitted with a second PID controller. The drive can be used to control multiple pumps - allowing for variable speed control and the energy efficiency benefits which that brings, to be applied to different units while the others are running effectively Direct On Line (DOL). It can even run pump cleaning cycles automatically, to a schedule, or on demand which should be of great interest to operators of waste water sites where features such as this have historically had a patchy track record of effectiveness.

Instead of relying on single set points for trip activation, an algorithm in the drive can effectively detect the fan or pump torque curve of the attached load and react appropriately when operational limits are approached, which means an end to nuisance trips caused by unusual but not critical load variations.

Far fewer false alarms means more uptime, fewer maintenance trips and faster responses to genuine issues such as jammed pumps, broken impellers, snapped belts, etc. which can now be more accurately detected by the drive.

Another advanced feature of the F800 is a motor preheat function, which aids smooth start-up, dispels condensation, and prevents damage due to freezing in outdoor conditions. Its real-time control capabilities can also detect and reduce vibration due to mechanical resonance, protecting other equipment from excessive wear, mechanical damage and premature failure.

At the other end of the scale in the event of an emergency situation a fire override mode will keep extraction fans and water pumps running – even



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to the point of the F800's total destruction.

## Energy optimisation

Improving energy efficiency for an already efficient product is all about making small advancements on many fronts and the Mitsubishi F800 has a wide range of dedicated features and functions that create efficient operation. For example, during standby all unnecessary circuits are shut down to reduce energy usage. Advanced Optimum Excitation Control (AOEC) maximises energy savings even for high torque loads, while intelligent cooling fans only activate when required because a set point temperature has been reached. In addition, the F800 is capable of controlling the external control panel cooling fans based on the control panel temperature, this removes the need for a thermometer within the panel, saving panel costs.

A related feature is that the F800 provides plug-and-play auto tuning for both induction motors and high efficiency permanent magnet motors. For ease of set up, a one touch Digital Dial allows direct access to all important parameters, while connection to graphical operator terminals and HMIs is kept very straightforward.

Alternatively an optional six line LCD display includes an easy start-up wizard function. This display is also able to display customised text messages. HMI auto-detect capability means connection to an HMI is straightforward.

To enhance the reliability of the F800, fault finding is aided by a built-in data logging and tracing function. Intelligent predictive maintenance is achieved through the monitoring of critical components such as power capacitors and cooling fans. A two channel emergency stop provides a safe shutdown which can prevent damage to the drive.

As with all new products launched by Mitsubishi Electric, the F800 has been designed for maximum backwards compatibility with earlier

generation drives. Existing installations can be upgraded to a new F800 in a simple unplug and swap-out process.

With network connectivity now of major importance, the F800 has the capability to communicate via CC-Link, Profibus, Ethernet, EtherCat, SSCNETIII, DeviceNet and Lonworks, whilst RS485, Modbus, BacNet etc are fitted as standard. A wide range of I/O connections is complemented by options for input and output reactors, DC link chokes, harmonic filters, regeneration units and braking modules.

Mitsubishi Electric products are known for their unrivalled quality and reliability. The F800 is sold with a 3 year warranty as standard.

The F800 is in full compliance with European EMC Directive standards. It meets safety directives, has marine approvals, Tüf, UL, cUL and CE certification etc.



## About Mitsubishi Electric

With over 90 years of experience in providing reliable, high-quality products to both corporate clients and general consumers all over the world, Mitsubishi Electric Corporation is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications,



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consumer electronics, industrial technology, as well as in products for the energy sector, water and waste water, transportation and building equipment.

With around 124.000 employees the company recorded consolidated group sales of 39.3 billion US Dollar\* in the fiscal year ended March 31, 2014.

Our sales offices, research & development centres and manufacturing plants are located in over 30 countries.

Mitsubishi Electric Europe, Industrial Automation – UK Branch is located in Hatfield, United Kingdom. It is a part of the European Factory Automation Business Group based in Ratingen, Germany which in turn is part of Mitsubishi Electric Europe B.V., a wholly owned subsidiary of Mitsubishi Electric Corporation, Japan.

The role of Industrial Automation – UK Branch is to manage sales, service and support across its network of local branches and distributors throughout United Kingdom.

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